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EDITORIAL NOTE.

The principal aim in the publication of the Princeton Contributions is to provide a convenient outlet for the Philosophical activities of the University. It is hoped that the development of the Seminary work of the department may render more frequent issues possible. The second article of this issue was prepared originally for the Philosophical Seminary.

THE METAPHYSICAL WORTH

OF THE

ATOMIC THEORY.

By

Dr. FRANCIS KENNEDY.

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THE METAPHYSICAL WORTH OF THE ATOMIC THEORY.

There are in general two possible questions concerning the validity of the atomic theory; firstly, that of its value to natural science—secondly, that of its value to metaphysics.

The former of these questions we shall not, on account of lack of space, here consider. Fechner, by his admirable defense of the atomic theory, has made such an examination superfluous, for he has gathred together in the most thorough and convincing manner all of the many grounds of the scientific atomic hypothesis.* We therefore shall not attempt to enter into this question but, basing ourselves on Fechner, we shall rather presuppose the full validity of the scientific atomic theory.—Thus is the following to be considered neither a defense of nor an attack upon this hypothesis of science. Our problem arises as soon as the validity of the atomic theory is presupposed or proven and is thus a purely metaphysical one.

Having thus presupposed the truth of the atomism of science we turn from this our necessary starting point to the question proper. This falls into three minor problems—

I. As introduction and condition of what follows; what is the relation of metaphysics and science in regard to the atomic theory?

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* "Physikalische und philosophische Atomenlehre" 1864.—See also Lotze "Streitschriften", Heft I, 1857, Cap. I., and Wundt "Logik", II. 1, 1894, Seite 429 ff., 513 etc., etc.

II. Is the atomic theory of unconditioned metaphysical value—that is, does the atom as described by science exist?

III. If not, has it then any relative significance for metaphysics?

We shall proceed immediately to the first of these problems.

I.

What is the relation of science and metaphysics to each other in regard to the scientific atomic theory?

The only relation between metaphysics and the scientific atomic theory which here concerns us is one of objective logic. Our question is that of whether any necessary metaphysical import is contained in this hypothesis.

Here at the very beginning certain difficulties arise which must be immediately considered, for such a question as the above can no sooner be asked that it is straightway denied that metaphysics and the atomic theory come into relation at all, or that the atom has any metaphysical significance. The grounds for such a denial are in general two, which we must consider separately.

In the first place it is customary to banish the atom from the realm of metaphysics by means of the conjuring word "auxiliary concept" *(Hülfsbegriff),* for if the atom be *merely* such, then metaphysics has no occasion to trouble herself about it.

Now it may first of all be doubted that the term auxiliary concept may with justice be applied to the atom, for the former is *essentially* a concept without an object: in other words could the existence of the atom be proved then the concept would no longer be merely auxiliary. But the problem of the existence of the atom is, as is evident and as we shall later attempt to prove, one for metaphysics alone, with which science has nothing to do. Therefore whether the concept atom is to be considered merely auxiliary or not depends upon a metaphysical view of a purely metaphysical problem. It thus seems unjust to apply this term to the atom in so for as it is a product of pure science.

But it ultimately makes little difference to us whether this term be employed or not, for it in reality offers no solution to the problem that is essentially bound up in the atomic concept and for the following reason.

In the first place it must be pointed out that the concept is a necessary one, whatever else way be predicated of it. Science is driven to it with the necessity which reigns in her sphere and it is already implicit in her very starting point. This indeed is to be admitted generally.

But what concerns us more is that the concept whether auxiliary or not necessarily includes the characteristic of existence. Now it must in this connection be remembered that we are speaking of the atom only in so far as it is treated by science alone, and we mean to say that the concept thereof as such essentially includes the determination of existence. That this is true must immediately be seen from the fact that to science atoms are ever and always causes. This is certain for if they were not conceived as such they could serve no purpose of hers. It must moreover be observed that they are causes of such effects as can by no endeavor be classified as mere auxiliary concepts. But if the atom is to be concieved as a cause, the concept thereof certainly includes the characteristic of reality, for reality is a necessary determination of the concept cause.*

It therefore matters little from our point of view whether the term “mere auxiliary concept” be applied to the atom or not. What concerns us is that it is a necessary concept which essentially includes the determination reality.

The second objection to our introductory question comes from a view of the world arising from the theory of knowledge. The epistemologist goes out from actual experience to determine the concept of possible experience. Working as he does on the purely conceptual aspect of experience, a tendency arises which, in a case like ours, seldom fails to make itself known; namely the spontaneous identification on the part of the epistemologist of the actual and possible in so far as they relate to experience.* Or to be more exact, the former concept is taken up into the latter and thus disappears. The fallacy (for such it is) in its fullest form appears in the statement that whatsoever belongs to the concept experience belongs to experience. It is simply the failure to distinguish between the intuitive and conceptual aspects of experience. Now the epistemologist seems to have little difficulty in placing the atom or system of atoms under his concept of experience. Belonging thus to experience in general it would offer no special problem to metaphysics and she would be no more called upon to treat it than to treat any other object of experience.

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* By this we do not, of course, mean to answer by one stroke the problem of the metaphysical existence of the atom, for this constitutes the central problem of our whole essay.

Now by making use of our former conclusion as to the relation of the determination existence to the atomic concept and by applying the just mentioned fallacy it would not be difficult to defend ourselves in respect to our introductory question concerning the relation of metaphysics to the atomic theory. For it would be easy to show, as is immediately apparent, that the atom, although necessarily conceived as existing, is not a member of *actual* experience and that therefore the above mentioned subsumption of the epistemologist and his deduction therefrom are false. This, as is evident, would suffice to prove that the scientific atom-system does constitute a special problem for metaphysics. We, however, wish to go one step further in the matter in order to show that the original mistake of the epistemologist is his subsumption of the concept atom or system of atoms under the concept *possible* experience; in other words we desire to prove that the atom is not an object of possible experience. If we can succeed in this, our end will evidently be accomplished.

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* Kant did of course make this distinction in his "Postulate des empirischen Denkens überhaupt". (Kritik der reinen Vernunft, 1787, S. 265 ff.)

Kant has shown that "was mit den formalen Bedingungen der Erfahrung (der Anschauung und den Begriffen nach) übereinkommt, möglich ist,"* which is certainly a universally acceptable construction of the concept possible experience. Among these condition of experience the "System der Grundsätze"** contains the following two:

a) "Alle Anschauungen sind extensive Grössen".

("Axiome der Anschauung.")

b) "In allen Erscheinungen hat das Reale, was ein Gegenstand der Empfindung ist, intensive Grösse, d. i. einen Grad."

("Anticepationen der Wahrnehmung.")

It would also be impossible to find any fault with these principles. We shall consider them separately.

a) If the atom as described by science, that is as existing in space, be an object of possible experience it must possess extension. But in the third part of this essay we shall seek to show, aided by Lotze, Hartmann and others, that the atom must be conceived as being punctual, that is unextended. This proof we are unfortunately, on account of the lack of certain material, compelled to defer but we direct the reader immediately to it. If this be so and the atom be unextended it is them not an object of possible experience.

b) In the second place, every object of experience which exists in space must have an intensive content. Now in the case in hand—that is in respect to an object in space—this intensive factor is sensation (Empfindung). Therefore the atom to be an object of experience must have a sensational content, as is otherwise evident.—Now according to science herself, corresponding to every sensational factor of outer experience there must on the mechanical side be some equivalent physical term. According to the view of this mechanical sphere implicit in the atomic theory, this physical term is motion and can be nothing else.[*] Therefore corresponding to every sensational element of outer experience there must exist, on the purely mechanical side, a certain quantum of motion. From this it is evident that there must always remain a certain quantum of motion in the purely mechanical sphere which cannot correspond to purely quantitative (mechanical) terms of experience but must have its equivalent in intensive (sensational) elements thereof. But the atom, as noticed, must, in order to fall within experience, have a sensational content.

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* "Kritik der r. Vernunft", 2te Aufl., 1787. S. **265 ff.**

** In the "Kritik der r. Vernunft".

In other words, the greatest quantum of motion possible within the limits of experience cannot be greater than the sum of motion in the purely mechanical sphere (= atomic system) as described by science, *minus* that quantum of motion which corresponds to the intensive factor of outer experience. But if this be so, the mechanical world of atoms as existing in the spacial interrelation described by science is not as such an object of possible experience.[**]

According to the foregoing we may describe the atom as a necessary concept which includes existence as one of its essential determinations and which cannot be subsumed under the concept possible experience. Or in other words, from the standpoint of science, hyperempirical reality is a necessary attribute of the system of atoms.

If this be valid it is at once evident that we have justified the necessity of our initial question and that the atom does constitute a special problem for metaphysics. This problem is that of the critical examination of the atomic concept, especially in regard to the grounds and conditions of this characteristic of transcendental reality.

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[*] Cf. Wundt, "Die physikalischen Axiome und ihre Beziehung zum Causalprincip", 1866. The first of these axioms is — "Alle Ursachen in der Natur sind Bewegungsursachen."

[**] We must here repeat that we by no means wish to imply that this "system of atoms" does possess metaphysical reality. We desire only to show that the concept thereof cannot be subsumed under the concept possible experience.

The atomic concept, as just described, corresponds in general to the concept of mechanical nature, for the latter as mechanically selfcomplete and independent of any particular experience is not to be distinguished from the former. Either may be described as the hyperempirical content of a practically endless time and space and as such we shall speak of it simply as "Nature".*

Having in this manner justified ourselves of the general problem of the essay we shall consume the remainder of this introductory chapter by attempting to answer two questions which immediately arise:

a) What is the relation of this hyperempirical atom system as described by science to experience?

b) What is the relation of metaphysics and science to the former?

a) Suppose that in the conceptual world of an hyperempirical atom system the characteristic of reality be metaphysically valid; or in other words, suppose that that system as described by science exist—what then would be its relation to outer experience? In the first place, this transcendental mechanical world is a ground of the events of outer experience.

The starting point of science is, in general, the demand for the complete causal explanation of every event in outer experience. But such an explanation requires, in regard to each event, a mechanical complement of an infinite series of events. This infinite series is the causal ground of the event in question. Now, as already shown, in order to secure such a principle (i. e. a complete mechanical ground of things) science is compelled to transcend experience in the narrow sense and seek it in a transcendental world, which is identical with the atom system. In other words, the hyperempirical atom system is the mechanical ground of the events of outer experience. Now while the validity of this cannot be doubted, if the foregoing be true, it is necessary to observe that we use this term "ground" only to signify that the events of outer experience are determined *according to* the laws and events of that transcendental mechanism. We do not mean to imply that in the presuppositions of science in regard to that sphere are bound up any implications as to the mode or means of interrelation between experience and this hyperempirical "nature".

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* That this conclusion as to the demand on the part of science for such a principle is valid does not, as already mentioned, depend upon the foregoing proof alone but is immediately evident as soon as the above described fallacy of the epistemologist has been overcome.— Cf. von Hartmann, "Krit. Grundlegung des transcendentalen Realismus", 1875, Einleitung.

Science puts no construction on the interconnection between these spheres and the whole problem, if answerable, is left over to metaphysics. What she does says is that the events of outer experience are not determined by events of outer experience but according to the events of this hyperempirical "nature". Experience cannot contain the complete mechanical ground of its own events. This interrelation between these spheres is therefore simply logically construed, in which construction there lies no direct metaphysical implication. In this sense is the transcendental atom world the ground of the events of outer experience and in this sense only do we speak of it as such.*

We have shown that this hyperempirical ground of the events of outer experience is the property of metaphysics as well as of science.

What place does it hold in the metaphysical view of the world (supposing again that it be real)?

It is evidently still, in the given sense, a ground of the events of outer experience. But while to natural science there can be but one such ground, in metaphysics there exists the possibility of another ground of experience, namely an absolute which shall be the ground of all being. Now in order to distinguish between these metaphysical possibilities, we shall speak of a possible absolute as the primal, the atom world of science as the secondary ground of the events of outer experience. The latter is secondary because, in case of the existence of an absolute ground of things, it would be a sphere of realities and events conceived to be dependent upon that absolute ground.*

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* This description we do not claim to be exhaustive. We have followed it only so far as suits our immediate purpose, to be developed later.

Up to this point we have merely striven to show that natural science has constructed a system of concepts which bear the characteristic of existence and whose possible object is, in the metaphysical aspect of the world, a hyperempirical, secondary and atomic "ground" of the events of outer experience.

b) Our second problem is that of the determination of the respective relations of science and metaphysics to this transcendental atom system.—In order to accomplish this we are compelled to pause in order to make clear a distinction which here and elsewhere will prove of value to us.

This distinction is one which was originally expressed in the scholastic terms *intentio prima et intentio secunda.* For our purpose we shall speak of the *intentio prima* of a thing as the relation of the thing to itself; or to be more exact the relation of the parts of the thing to each other or to the whole. It is the aspect of the thing when seen in its isolation and considered for itself which Hegel expressed in the term *An-sich-seyn.* By the *intentio secunda* of a thing we mean the relation which it or any of its parts has to the rest of the world or any part thereof; its *Seyn-für-anders.* *

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* The monads of Leibniz and Lotze are examples of this principle, for, though dependent upon a higher principle, the order of experience is referred to them for explanation.

It is evident that the scientific aspect of a thing is never exhaustive and that therefore the scientific aspect of this hyperempirical "nature" cannot be such. What then is the limit of the scientific treatment of this object?—This question, as the first step in the determination of the relation of metaphysics and science to this transcendental "ground" of experience we hope to answer in the most universal concepts possible by means of the terms just defined.

Speaking once more of this "nature" as of a really existant object of science, we may in general limit the matter of science (in so far as she relates to this transcendental object) to the first intentions of this "ground" in so far as they consist in orderly second intentions of its parts, or in such first intentions (of its parts) as are convertable into such second intentions. To put the case negatively, science can investigate neither the second intention of the transcendental atom world (considered as a whole) nor the first intention of any part thereof, except when that first intention is reducible to second intentions within the general first intention of "nature" as a whole.*

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* This distinction was of frequent use in the Scholastic philosophy and was defined by Goclen as follows —

Prima intentio objectiva est omne id, quod per actum directum cognoscitur.

Secunda intentio objectiva est omne id, quod per actum reflexum intellectus cognoscitur, sive sit ipsa actio intellectus, sive potentia, sive ea, quae conienvunt rebus, pro ut sunt in subjecto objective. (Goclenius—"Lexicon philosophicum" MDCXIII. p. 253).

These terms continued to be used in later philosophy by Descartes, Leibniz etc. (cf. Eucken "Geschichte der philosophischen Terminologie", 1879, S. 69) but the meanings, as above given, were soon exchanged for others. And the thought expressed by Goclen has reappeared frequently enough (cf. Spinoza, "Ethica", Pars I. Axiomata I. et II.; Hegel "Kleinere Logik", § 91; etc.) but Hodgson seems to have been the first thinker to reunite the terms to the thought. (Cf. Shadworth Hodgson, "Time and Space", London, 1865, § 10). From him we take them but in a metaphysical, rather than in the psychological and epistemological sense in which he makes use of them.

It is unfortunally impossible to prove such assertions as the above and we are thus compelled to simply appeal to the reader for the recognition of their truth. Their value will, however, be admitted if the trouble be taken to examine the actual operations of science in respect to what has just been said.

The atom system is thus to science a principle which, though not given in experience, is posited as real although the problem of its second intention (seen as a whole) cannot be investigated But it is evident that such a principle can become wholly rational only when its possible second intention, having been logically examined, is found to be without contradictions. In other words, a contradiction discovered in the second intention of the transcendental atom system would completely deprive the whole of its rationality and thus of its metaphysical validity and therefore its existence as a necessity of thought. But as science is herself incapable of attempting such an investigation it is evident that the existence of this atom system as a necessity of thought is dependent upon certain conditions. But a principle whose existence as a necessity of thought is conditional is, in a word, an hypothesis. What then are these conditions under which the atomic theory as described by science exists as metaphysically valid?

We have shown that this hypothesis is one of a secondary "ground" of the events of experience. Thus the first condition of the metaphysical validity of the atomic theory is evidently the existence of such a ground. For if there can exist for metaphysics no such principle as the one of which the atomic theory is an hypothesis, then is the latter evidently without metaphysical worth. Moreover this "ground" must (in order to be valid for metaphysics and science) exist under the forms of time and space as they are presupposed by science. If it does not, then the atomic theory is again metaphysically worthless, for such a time and space are essential presuppositions of the atomic theory.

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* Though true as far as they go we make no claims as to the exhaustiveness of these statements. They are not definitions but limitations which we have followed only so far as suits our purpose.

But on the other hand should there exist for metaphysics a spacio-temporal ground of the events of outer experience, then would the atomic theory be metaphysically valid (that is would possess the unconditioned determination of necessary reality) for the simple reason that the atomic theory is *conceivably* the only possible internally rational theory of such a ground. Any other is simply unthinkable and should metaphysics attempt the construction of a spacio-temporal secondary ground of outer experience she could not conceive it other than atomically. *

Now as we have shown, the problems involved in these presuppositions of science in regard to the existence of this transcendental atom system do in no sense belong to science but are solely possessions of metaphysics. It is therefore at last possible to answer the question with which we started—what is the relation of metaphysics to the atomic theory of science.

The atomic theory we proved to be a hypothetical concept system the possible object of which is a spacio-temporal but transcendental "ground" of the events of outer experience. As such its interal worth (i. e. scientific validity) is not to be doubted.

Metaphysics is related to this principle in that to her falls the problem of examining the rationality of the conditions of such an object. The atomic theory is a hypothetical determination of the *Ding an sich.* As an hypothesis it is of internal validity. The problem of whether metaphysics can conceive the rationality of the existence of the possible object of the atomic theory—that is whether the atom must be thought to be real or not—is the problem of the spacio-temporal nature of the *Ding an sich.* As von Hartmann has shown, the metaphysical validity of the atomic theory is conditioned by a transcendental realism.

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* We must remind the reader in this connection of our initial presupposition as to the scientific validity of the atomic theory.

II.

In this second part our problem is that of the unconditioned metaphysical value of the atomic theory, or that of whether the characteristic of reality which we found to belong to the atomic concept as prepared by science be metaphysically justifiable or not. This question, as shown, is that of the conceivability of the metaphysical conditions of the atomic theory, one of which conditions is the existence of space, as presupposed by science, as a form of the secondary ground of the order of outer experience. If we can thus show the irrationality of space as such a form we shall thereby prove the worthlessness of the atomic theory as a metaphysical hypothesis of the nature of this ground. This we shall attempt.

Could the antinomies of Kant be allowed the logical worth which he claimed for them we would be spared our proof. But they are at best suspicious.* Too much depends upon the word "impossible" *(unmöglich)* which he uses so often and with such comfort. For it must be shown, in order that the value of the antinomies be established, that these "Unmöglichkeiten" exist not for the imagination alone, as seems to be the case, but also for thought itself. We shall therefore essay a proof of our own. In this proof we shall attempt to deduce certain characteristics from the general concept of space which shall be incompatable with the space of natural science—i. e. an objective space.

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* Cf. Schopenhauer, Anhang zur "Welt als Wille und Vorstellung" (2. Frauenstädt'sche Aufl., Band II, S. 583 ff.); and Lotze, "Metaphysik", 1879, §§ 106-7; and F. Erhardt, "Kritik der Kant'schen Antinomienlehre", 1888; and Trendelenburg, "Logische Untersuchungen", 1840.

Lotze in a very detailed and admirable manner has attempted a proof of what he calls the phenomenality of space.* This argument is nothing more or less them an incisive attack on the conception of space as a self-existant thing. From our standpoint there is something unsatisfactory in this proof, however admirable it may be, for a transcendentalism realism is not inconceivable even if it be admitted that space must be thought to be a form of conscious intuition. **

Lotze, we believe, failed to exhaust the possibilities of his proof by not carrying it out to its limit, for instead of seeking to solve the contradictions discovered in the concept of a self existant space in a purely logical manner, that is by reference to purely spacial principles, he solves them by means of the introduction of time into the problem, i. e. psychologically. Had he carried his proof one step further he would, we believe, have accomplished what we now seek to accomplish—namely a sufficient demonstration of the inconceivability of an objective space. This we shall ourselves attempt and indeed by taking up the leading idea of Lotze's proof—that namely of the application of the question "how are points in a unified space distinguishable from each other?" to the concept of objective space. (Instead of to the concept of space as a self existant thing.)

Since we treat this question in a purely logical manner, to solve it psychologically by means of some non-spacial principle such as time or motion would, no matter how correct from the standpoint of psychology, be premature. For in general a space unified and consisting of distinct elements but timeless and therefore containing no motion is not inconceivable.*

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* "Metaphysik", §§ 105-115; and "Mikrokosmus", 1856, Bd. III, Cap. 2. Cf. Johannes Franke, "Über Lotzes Lehre von der Phänomenalität des Raumes", 1884.

** Cf. for example von Hartmann, "Kritische Grundlegung des transcendentalen Realismus", 1875, S. 132 ff.

Our question is that of the *spacial* diversity of the parts of space (if we may thus express it) and is purely logical. As such it may, furthermore, not be solved by reference to the principle of what Lotze calls "ein Substrat unsagbarer Art als selbständiger Träger der Relationen des Raumes", for in that case the problem would be merely shoved back and in reality left unanswered. Moreover the possibility of such a *Substrat*, which in order to afford any explanation must itself be spacial, Lotze himself, in the above mentioned proof, has done away with. Finally our question may not be answered by a mere reference to the whole of space as something which is in its very nature unified and whose elements are distinct simply because they are different parts of the whole. For this is our very question—how space becomes a whole and how its parts are distinguishable. That this is in general a reasonable question one, having read the above mentioned proof of Lotze, will admit.

Moreover, if space as an already unified whole be presupposed in order to explain the diversity of its parts, then each of these parts, in order to be distinguished from any other part, must hold a relation to the whole different from that of any other part to the whole; otherwise the presupposition offers no explanation. But such a relation must be a space relation. But it is absurd to speak of a *spacial* relation of a point to the whole of space. Furthermore, if these parts are to be distinguished from each other by means of their relations to the whole of space, then each of these relations must be different from every other relation. But such differences can be found only in the relations of the parts to each other.

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* That the opposite was held by Trendelenburg ("Logische Untersuchungen", 1840, Cap. IV. V.) was due not so much to his view of space as such but to his general metaphysical doctrines.—Cf. Wundt, "Logik", 2. Aufl., 1893, Bd. I, S. 579 (5. Axiom).

Later we shall prove that the atom must be conceived as being punctual. We may therefore, for the sake of convenience, confine ourselves to such space as arises out of points. For could not space be so conceived our proof, which always has a special reference to the atomic theory, would already be accomplished, for then the relation of the atom to space would be contradictory.

Our question is therefore how points may be thought to be united into a spacial whole and distinguished from each other therein. This must be solved without reference to any principle other than space—without reference to space as a whole already unified—and without reference to "der Träger unsagbarer Art".

Our method will be that of first applying this question to the concept of space in general and then applying the results of this analysis to the concept of objective space in order to show that the latter cannot properly be subsumed under the former.

Since in its very nature the point is in its first intention spaceless, points can be spacially distinguished only by means of their second intentions. But this is not true of points only but also of any possible content of space as Kant has amply shown* and as is an every day matter of fact. For this must be thought to constitute the most ultimate feature of space, whatever its form, that its elements be distinguished spacially solely by second intentions. In other words a space in which each of its elements are in their first intentions identical and yet distinguished is perfectly conceivable. Now according to our preface just made, these second intentions as the principle of spacial distinction must themselves be spacial. Our question is therefore that of how points may be united into a whole and be distinguished from each other therein by means of spacial second intentions. This is a question as to the possibility of space in general.

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* "Kritik der reinen Vernunft". 1te Aufl., S. 272 ff.
Cf. also Wundt, 'Logik", 2te ufl., 1893, Bd. I, S. 580.

We shall first seek to answer this question in so far as the straight line is concerned.

Suppose the existence of the points *a*, *b*, *c*, ... *r* and suppose that there exist no others. How are these points to be united by second intentions into a unitary line in such a way that every point is distinct from every other one?

Suppose again that *a* relate to *b* and to no other, *b* only to *a* and *c*, *c* only to *b* and *d* etc. Now these relations though they be second intentions and spacial, do not solve our problem, for, according to the hypothesis just made, *r* cannot be distinguished from *a* for the reason that they do not relate at all. In spite of the clamors which the intuition raises to the contrary, these points fall together and are not distinct. Our problem must be answered by other relations than those expressed in the hypothesis.

Suppose then that instead of the above mentioned relations *a* be taken as a central point and that every other point relate to it and to it alone in such a way that the relation of each point to *a* is different from that of any other point. Then are the points both united into a line and distinguished from each other therein, for the relation of every point to *a* is different from that of any other possible point. Moreover, these relations are spacial second intentions. This then, in that it fulfills all the conditions of our problem, is the solution thereof. But is it the only possible solution? Let us make the third and only other hypothesis possible.

Suppose that each of the points above mentioned be related indifferently to every other point.—A difficulty with this supposition at once appears which was not apparent in connection with the other two: Would the points as above described constitute a unified space? In a unified space each point must be distinct not only from every other point but from every other possible point. This is expressed in the statement that every point must have a definite place or position. But place is a purely relative term, that is the position of a point is determined by its relation to one or more other points. Now if any one of the points in question be separately examined in its relation to all the other points, it will be seen to have a definite place, as will all the points. But if two or more be taken a new difficulty arises, namely that each of the points not taken will possess a different position when seen in relation to the first point than when seen in relation to the second. In other words, since position is the constitutive element in the concept point, r when seen in relation to a is not the same point as when seen in relation to b. Thus are there (under the conditions of the hypothesis which must ever be kept in mind) as many spaces implicit as there are points, and each of these spaces is entirely distinct from every other one.* —Thus are we driven back to our second hypothesis as the only satisfactory one of the possible three.

While believing in the entire validity of the second solution to our question we must make clear a distinction in order to relieve it of further doubt. This distinction is that between necessary or determining relations in space and those which are not necessary. All the relations expressed in our second hypothesis are of the former class for the reason that should any one of them be omitted the point concerned would fail to be determined. But besides these necessary relations there are others which may also exist and it is indeed possible that every point in space relate to every other point but it is not possible, as proved, that each of these relations be essential or determining. We thus conclude that in respect to a line considered out of relation to all other spacial elements, every point must relate to a central point and that there can be but one such central point, which we may perhaps be allowed to call the *determining* point.**

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* Cf. Lotze, "Metaphysik", 1879; S. 214 ff.

** The relation of the point to be determined to the determining point may be indirect, that is through another already determined point

The following may help to establish and clarify the final statement in the text.

It is therefore evident that in a space of but one dimension a central determining point to which every other point directly or indirectly relates is a condition of a unified line of distinct points. But if this be true of space of one dimension it must be valid for space of all other dimensions, for in the former all of the essential features of space in general are present. This needs no proof. Therefore in every space there must be a single determining point.

We started out with the assumption that a space arising out of points identical in their first intentions is perfectly conceivable. And this is true in so far as the points in question are merely objectively considered. But in regard to their subjective aspect we have come to exactly the opposite conclusion, as must already have been noticed; for we have shown that in every space there must exist a "determining" point. But this point, in order to perform its functions in space, must be distinct from all other possible points. Now this distinction, which exists in the first intention of the points in question, can lie only on the subjective side of space, for the "determining" point as such cannot be described in purely spacial (objective) terms, but in order that it be sufficiently described certain subjective elements must be employed. Space without a starting point—space which does not radiate from a "here" is simply unthinkable. But this "here" is simply a point selected from the other possible points. In this lies its subjective nature. It is therefore not purely a

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Suppose the existence of the points b, c, d, e, f which relate to the point A as to their determining point. Moreover let there be no other points. Can the point f also be a determining point? that is can f be identical with F', e with b' etc.? If the case be carefully examined it will be seen that f cannot be identical with F' because the line F' e' d' c' b' a' is identical with the line A b c d e f, for there are absolutely no logical determinations which are capable of distinguishing A from F'. Therefore A is identical with F', b with e' etc. It is absurd to speak ot two determining points in one line, for either the lines are not one line or the determining points are not two distinct points. The matter cannot even be expressed in a comprehensible hypothesis.

term of objective space and cannot be described merely as having peculiar relations to other points. It is therefore evident that in every space there exists a certain subjective element.

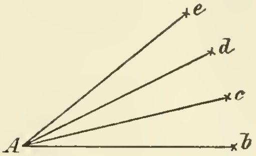
Our purpose is thus to all appearances accomplished, for we have shown that the conception of a purely objective space contains contradictions. We however wish to carry our proof one step further in order to show how this subjective element in all space destroys its scientific value. This we shall attempt to do by seeking an answer to our original question in regard to space of two dimensions. How then are points to be united into a unified plane so as to be distinct from each other?

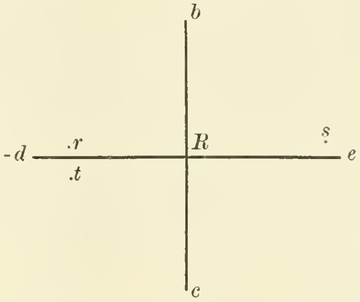
From the preceding it is evident that a number of points which relate only to one determining point form a straight line and can form nothing else, for in order that a point be distinguished as not lying in that line, some other principle than that of the mere relation of the points in question to the determining point is needed. This principle, as shown, must be a spacial second intention. This principle cannot, however, be that of a second determining point as was proven.

Moreover such a second point would not be sufficient to determine points as lying in the plane.—Furthermore it cannot be that the points in question are determined as lying in the plane by means of their relation to the single central point and then by their indifferent relations to every other point, for we have already proved that the mere indifferent relation of points to each other have no determining power.

If these hypotheses be false, suppose that the points etc. in the following figure exist as there represented and that there be no others.

The problem is how *e* can be distinguished from *c* etc. by spacial second intentions. First of all each of these points must relate, as proved, to the single determining point *A*. But this relation, as shown, will not distinguish *c*, *d*, *e* as not lying in the line *A b*. Therefore if these points are so to be distinguished, the line *A b* must be selected as a determining line and the points in question must be determined by their relations to it (together with their relations to the determining point). For if the points *c*, *d*, *e* are to be seen as not lying in the line *A b* they must be seen to relate to *A b*. Moreover, in order that *c* be distinguished from *e* each of these points must hold different spacial relations to some common spacial principle other than the central point (A), which common principle, according to the foregoing, can be nothing else than the line *A b*. This line is thus to be considered the determining line of this plane. But space of two dimensions is peculiar in that four of these determining principles are required in order than any point in the plane be distinguished from any other point. This is proved by the following. In the above figure let *A* be the determining point of the plane and let the lines *Ab*, *Ac*, *Ad*, *Ae* be fixed and distinguished from each other. Our problem is to prove that all these lines are necessary as determining principles in order that any points *r*, *s*, *t* be distinguished from each other in the plane.—As already shown these points cannot be distinguished from each other merely by their relations to the determining point, nor by their direct and indifferent relations to each other, but only by their relations to one or more of these lines.





Suppose that the points *r* and *t* relate to the determining point *A* and to the determining line *A d* but have no other relations. Moreover let the relations of the points in question to Ad and to A be respectively of equal length. It is evident that these points cannot be distinguished by these relations and that they fall together and are identical, for each point holds exactly the same relations to all common principles as the other. Therefore these relations fail to distinguish them. But according to the foregoing, the only other distinguishing relations allowable are those of the points in question to the other lines Ab, Ac, Ae. Therefore suppose that besides the above mentioned relations, r relate also to the line Ab and t to the line Ac. Suppose moreover that there be no other relations than these. Then are the points r and t distinguished from each other and fully determined in the plane, for r relates not only to A and to Ad but also to Ab, but t instead of relating to Ab relates to Ac. Therefore the lines Ab, Ac, Ad are necessary distinguishing lines in the plane, for should any one of them be omitted it would not be possible to distinguish any possible point from any other.—If it be further asked how r may be distinguished from s, or t from s, it will be seen that the line Ae is also necessary. For in order that s be distiguished from r, s must relate not only to A and to Ab but also to Ae. Therefore these four lines are necessary as the distinguishing principles of the plane. It is moreover evident from the foregoing that every point in the plane (except those actually lying in the four lines) in order to be distinguished from any other point must relate to two of the distinguishing lines.*

By all this we simply mean to assert, what is clear enough in the intuition of space—namely that in a space of two dimensions only there must not only be a "here" but also a determination of direction, or in other words a "right" and a "left", a "before" and a "behind". Without these determinations the plane collapses into a mere line, for in order that the line be spread out into the plane, certain starting points must be fixed and all other points related to them.*

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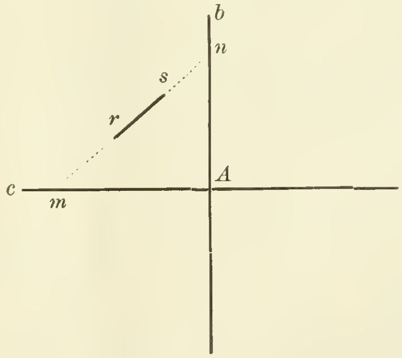
* How the lines are themselves distinguished from each other we shall not attempt to show, for although this would not be difficult it would only add to the complexity of our already too intricate proof. We must therefore content ourselves with having deduced the necessity of these lines. This suffices for our particular purpose.

Now these four determining lines cannot be described wholly in terms of objective space, that is they contain certain subjective elements. We have therefore come to the same conclusion in respect to the plane as in respect to the line—namely that a purely objective space is inconceivable. Our end, which was to show that space as presupposed by science contains contradictions and that therefore a scientific transcendental realism is unthinkable, appears to be accomplished. We however wish to show this with greater clearness.

The final and characteristic feature of the space presupposed by science is that the spacial value or extension of any line is unconditioned by any relation which it may hold to any other spacial element. In other words every element in this objective space must in some sense have an absolute value.

In the following figure let the point *A* be the determining point of the plane and let the lines radiating from it be the determining lines. Now as shown, the line *r s* must relate not only to *A* but also to the lines *Ac*, *Ab*. In other words, the value of the line *r s* is determined by the positions



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* Concerning the general validity of our thesis cf. Liebmann, "Zur Analysis der Wirklichkeit;" 1880; 2te Aufl.; Cap. "Relative und absolute Bewegung", especially S. 140 ff.

of the points *r* and *s*, which positions are dependent upon the relations of the said points to the lines *Ac* and *Ab*. But if *r* and *s* are determined in this way then the value of the line *rs* is evidently determined by its quantitative relation to the whole of the possible line *mn* of which it is a part. In space as we have developed it the values which are fixed and which must be dominant are clearly those which depend directly upon the conditioning elements in space, for they partake necessarily of the determining nature of the latter. That is to say that any spacial element which comes into such a relation as this to the conditioning principles of space must accept the value which these principles give it. But if this be so then the value of the line *rs* is conditioned by its relation to *A*, for should it be further removed from *A* or brought nearer to it its value would change. The value of *rs* is, say, $^1/_2$ *mn*; that is *r* and *s* are two of eight possible points at equal distances from *A* and each as for removed from its neighbor as *r* from *s*. But the value of *mn* is simply the value of the extension between the determining lines *Ab*, *Ac*. Therefore the line *rs*, should it be taken further from *A*, would change its quantitative relation to *mn* and therefore its spacial value, for the value of *mn* is directly dependent upon the conditioning principles of space. But if this be so then it is evident that the concept of objective space involves contradictions. Moreover since the space presupposed by science is objective it is further clear that the atomic theory is metaphysically invalid.

But the space presupposed by natural science is not only objective but is also a form of the secondary "ground" of the events of outer experience, as was shown. Now the transcendental realist must conceive this space either as a self existant thing or as a form of conscious intuition. But that it cannot be thought as being the former we have already striven to prove. For we came to the conclusion that space in general must contain certain subjective elements which take the form of a "here" and a "there" and certain fundamental directions. That is, space must be conceived only as a form of the subject-object relation. But if the space of the secondary ground of outer experience be a form of conscious intuition there must be a subject of that intuition. But this subject is the absolute. We have here no logical principle whatsoever which would enable us to deduce this result. We merely point it out as an historical induction. But it is nonsense to speak of an absolute whose intuition goes out from a single point—whose intuition is conditioned by a "here" and a "there", a "right" and a "left" etc.

If these results are so far valid we are enabled to conclude that space cannot be conceived as a form of the secondary ground of outer experience* and that could it so be conceived it would still fail to correspond to the demands of natural science. The immediate corollary of this, as already shown, is that the atomic theory is metaphysically invalid.

In order to come to these conclusions we have used, first of all, the principle that all spacial elements are spacially distinguishable only by means of second intentions. This we showed to be valid. Beyond this our proof has involved only such general geometrical principles as are universally held as true. We therefore claim for the proof, in so far as its separate steps are sound, a general logical validity.

We have not handled the problem of space of three dimensions, because it would only have embarrassed our proof with added complexities and because our results are evidently valid for three as well as for two dimensional space. Nor have we touched upon space of more then three dimensions, for the reason that the space of natural science is of three dimensions and for the reason that should the space of the secondary ground of outer experience be of more than three dimensions then atomic theory would be invalid for metaphysics.*

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* Cf. Liebmann, "Zur Analysis der Wirklichkeit", 1880; S. 37—86.

We have finally only to remark that this conclusion just made has no relation whatsoever to the problem of the. scientific value of the atomic theory.

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* See again Liebmann "Zur Analysis der Wirklichkeit", 1880; Cap "Über die Phänomenalität des Raumes".

III.

We have shown (I.) what is the relation of metaphysics to the atomic theory and have attempted to prove (II.) that the latter cannot be of absolute worth in the former. The problem with which we have now to deal is (III.) that of the possibility of a relative value of the atomic theory for metaphysics.

The result which we hope to reach in this part compels us to make an examination of the atom itself in regard to its relation to time and space, in order to discover whether it be timeless or not, and whether it be extended or not. We shall first take up the latter of these questions.

We notice in advance with Lotze * that "So lange man den Atomen Ausdehnung und Gestalt zuschrieb, musste man sich gestehen, im Kleinen eine Frage ungelöst gelassen zu haben, die man mit ihrer Hülfe in Bezug auf die grossen Körper lösen wollte".

In order, however, to secure a proof of this view of the relation of the atom to space we shall first of all make use of Lotze's own examination of the question involved.

If the atom, he explains, be both extended and at the same time unitary then must every movement of the point *a* thereof be also immediately a movement of the point *b* thereof. Denn "es kann in einer solchen Einheit des Wesens nicht Theile geben mit Zuständen, in denen andere Theile sich nicht befinden; jeder Eindruck, der dem einen Punkt *a* eines solchen einheitlichen Volumens *A* zukäme, müsste sofort auch Zustand oder Eindruck des ganzen *A* sein, ohne dass ein Vorgang der Übertragung nöthig wäre, durch den er von *a* an *b* oder andere Punkte des Volumens mitgetheilt würde Ich sehe wenigstens nicht ein, worin dann, wenn eine solche Verschiedenheit übertragbarer Zustände von Theil zu Theil stattfände, der Anspruch des *A* noch bestehen könnte, eine wesentliche Einheit zu sein".* But if such a unity be extended, as said, then the motion of the point *a* must be transplanted to the point *b*, that is through the distance *a b*, without any loss of time. Moreover the force which operated on *a* must operate on the more distant *b* with the same intensity as on *a*. But both of these suppositions are, from the standpoint of physics, impossible. Therefore either the unity or the extension of the atom must be given up. There can be little doubt that Lotze's choice in retaining the unity was the more rational one.

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* "Metaphysik", S. 369.

Probably the best proof of the punctual nature of the atom is the one offered by von Hartmann. It is to him so convincing that he allows his whole doctrine of matter, although an important and integral factor of his philosophy, to rest upon it. Unfortunately it cannot be stated in better or shorter form than his own, which we thus quote.**—"Soll man sich die Kraft an den Mittelpunkt des stofflichen Atomes gebunden denken oder auf den ganzen Stoff desselben gleichmässig vertheilt? Denn ein stoffliches Atom muss doch eine gewisse Grösse haben!" Bei der ersten Annahme "ist die Kraft eigentlich nicht mehr an den Stoff gebunden, sondern an einen mathematischen Punkt, der doch unmöglich stofflich sein kann, und der nur zufällig mit dem Mittelpunkt einer stofflichen Kugel zusammenfällt; dann ist das Wirken des Stoffes auf die Bewegung der Kraft erst recht nicht zu begreifen, vielmehr die stoffliche Kugel ein fünftes Rad am Wagen, da nur der Punkt des ideellen Centrums derselben zur Sprache kommt. Bei der zweiten Annahme sind die Schwierigkeiten jedoch noch weit grösser, denn dann wirkt ja von jedem Punkte des stofflichen Atomes ein Theil der Kraft, und jeder dieser Punkte hat eine andere Entfernung von dem Atome, auf welches gewirkt wird. Es ist dann erst von allen diesen Partialkräften die Resultante zu nehmen, deren Angriffspunkt nun beim Wirken auf endliche Entfernungen keineswegs mehr in den Mittelpunkt der stofflichen Atomenkugel fällt, sondern nach jeder Richtung des Wirkens ein anderer wird. Zu dieser Betrachtung aber muss man sich offenbar das Atom in unendlich viele Theile zerlegt denken, deren jeder mit dem unendlichsten Theile der Kraft behaftet ist. Mag man sich solch ein Atomtheilchen so klein denken, als man will, so ist es doch immer noch Stoff und kein mathematischer Punkt, also kann die Verbindung desselben mit der Kraft doch wieder nur begriffen werden, indem man die Kraft gleichmässig innerhalb desselben vertheilt denkt; so ist man abermals zur unendlichen Theilung gezwungen u. s. f., d. h. man muss das stoffliche Atom unendlich mal ins Unendliche theilen und kommt trotz alledem doch niemals dazu, zu begreifen, wie die Kraft an den Stoff vertheilt ist, da man die Äusserung der einfachen Kraft schlechterdings nur auf den mathematischen Punkt bezogen denken kann, und dieser nicht mehr stofflich ist."*

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* Lotze, "Metaphysik" (vom "System der Philosophie"), 2. Aufl., 1879, S. 369 ff.

** See E. von Hartmann, "Philosophie des Unbewussten", 1869, S. 417 ff.

The following may also be of at least suggestive value. —Matter, in the Kantian sense as opposed to form, may be distinguished from space as its possible form. But divisibility is not predicable of matter in itself, that is as distinct from space. Therefore inasmuch as space is infinitely divisible its content must be so also. Thus is it clear that the indivisibility of the extended atom is a purely mechanical term, that is it cannot be attributed to the so called

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* Concerning these proofs of Lotze and von Hartmann see G. Hartung in the "Philosophische Monatshefte", 1885, S. 1, ff.

"homogeneity" of matter but must be explained by forces of cohesion resident in the atom. But such forces must have unextended points as their centres;* for were the centres extended their indivisibility would in turn have to be explained. But since the relations of these centres are spacial and temporal the centres evidently belong to natural science as her final mechanical term, that is as the atom.— Science may as yet have been unable to treat them but ideally they belong to her lot. There is, however, no reason for believing that these force centres are not the very atoms already secured by science. We therefore conclude that the atom as the ideally last term of physics is unextended.**

Our second problem is that of the relation of the atom to time. It is at once evident that the atom in its second intention is temporal, for it is in ceaseless motion. In regard to its first intention, science has however held almost invariably the oposite view, namely that the atom is changeless, that is timeless. We must however ask what exactly this may mean.

In the sphere of the atoms, science deals merely with space relations and their alterations. It is thus clear that science treats of time (in this connection) only in so far as it governs space relations. That is time as coordinate with space and merely governing the change of relations in the latter must be distinguished from a possible metaphysical time which may be a form of inner events. That this distinction is necessary may be gathered from the history of of philosophy. It may furthermore be seen from the fact that although science may persist in the assertion that the atoms are in their first intention changeless she yet admits that under different spacial and temporal conditions they exert different degrees of force. (Cf. Lotze, "Metaphysik", § 81, and many other sections, where he attempts to show that the place of a thing in space is due to some inner state in the thing.) In this sense of time it cannot be doubted that the atom is in its first intention timeless, simply because, as proven, it has, as such, no space relations to be changed. We conclude, therefore, that the atom in its first intention is timeless and spaceless.

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* Cf. Wundt, "Logik", I, S. 621, das zweite der "physikalischen Axiome".

** Concerning this conclusion see Wundt, "Logik", II., Abschnitt III, Cap. 3, e. and Liebmann, "Zur Analysis der Wirklichkeit", S. 307 ff.

In this connection we must remark that we neither wish nor feel ourselves compelled to combat such newer scientific speculations as those of Lord Kelvin etc., for even should these views concerning the atom be correct they do not necessarily conflict with our conclusion. Lord Kelvin's "Atom", in spite of all that he affirms concerning it, can scarcely be considered the ultimate term in physics for the reason that it presupposes too much. (Cf. Lotze, "Metaphysik", S. 369, part of which we have already quoted.) But in this connection we are dealing entirely with the ideally last element of physics. (See the just mentioned chapter in Wundt's "Logik".)

That this must be so can at once be seen from our very definition of the limits of science in so far as she relates to the hyperempirical and secondary ground of outer experience. For in that definition we showed that science is occupied with such relations only as are either second intentions or such first intentions as are reducable to second. If this be so it is evident that science must finally come to elements whose first intentions do not belong to her at all and whose second intentions alone concern her; that is elements whose first intentions are not reducable to second without transcending the general first intention of "nature". But since in this sphere all relations are those of time and space it follows that the first, contrary to the second intentions of these last elements are spaceless and timeless. But these can only be the punctual and changeless atoms. To these science is forced in a steady descent from first intention to second and again to second until at last she inevitably reaches elements whose first intentions cannot be reduced to second. This not only shows the necessity of the timeless and punctual atom but also its fundamental importance in the scientific vision of the world.

Having, with the aid of Lotze and von Hartmann, established the punctuality of the atom and shown it to be, in the given sense, timeless, we must now return to the general result of our first chapter. There we proved that the atomic theory is an hypothesis of natural science, the conditions of whose metaphysical validity were those of the existence of a secondary ground of the events of outer experience under the forms of time and space. Now it is in general evident that such a "ground" must be thought as plural. But if plural it must have some last element which is as yet unknown. This we may characterise as X If what we have so far attempted to prove be true, the relation of the atomic theory to the problem of this X as the unknown ultimate term of the secondary ground of outer experience may be expressed in this manner—$X + T$ (time) $+ S$ (space) $= A$ (atom). This is an immediate corollary of the fact, which we proved, that if the secondary ground of experience exist under the forms of time and space it must be thought to be atomic in the scientific sense.

But we have striven to show (chapter II) that this possible "ground" cannot exist under the form of space. If this be so this "ground" must also be timeless, in the sense in which we have just spoken of time—that is as coordinate with space.

Therefore the X is spaceless and, in the given sense, timeless in respect to both intentions. Now let "q" as a coefficient stand for any *first intention* which is *spaceless* and, in the given sense, *timeless* and we may gather up all that has gone before into the following equation:

$$X^q + T + S = A^q + T + S.$$

But if T and S be elided then

$$X^q = A^q.$$

In other words, the X in its first intention is identical with the atom in its first intention.

Our result we were compelled, for the sake of clearness, to express in mathematical form, to which the thought itself is foreign. This we hope will not prejudice the reader, for the thought itself, as we believe, is sound and of some value.

The line of argumentation by means of which we have secured this result is the following: Having presupposed the scientific validity of the atomic theory we proved that that theory as a product of science is from the standpoint of metaphysics equivalent to an hypothesis of the nature of the secondary ground of outer experience. The conditions of the metaphysical validity of this hypothesis were found to be those of the existence for metaphysics of such a ground under the forms of time and space. Should metaphysics be able to construct a spacio-temporal ground of experience she could think it to be nothing else than atomic in the scientific sense. The atomic theory is not only scientifically true but under certain conditions is metaphysically valid. Now in this conditional worth must exist some positive metaphysical truth. This is our thesis and the hinge of our proof.—We next attempted to show, in a rather complex attack on the concept of objective space, that the absolute value (that is metaphysical validity) of the atomic theory must be given up. If this be necessary what then constitues the value, just referred to, of the hypothesis? It lies in the fact that a spacio-temporal ground of experience must be thought in accordance with the atomic theory of natural science. If this be so here then lies a criterion of the validity of any theory of the nature of this ground; for the atom and the X must always be the identical in their first intentions. That is the moment the X is cast under the forms of time and space it becoms the atom.

The atom, from the standpoint of the final view of things, is false because it relates not only to the phenomenal world but also to the noumenal. It must therefore be relieved of the contradictions which reside in it and must be translated into non-phenomenal terms.—We ourselves are far from desiring to attempt such a work in this connection—we are not even able to undertake the necessary preliminary justification of such an essay. By our result, for which we claim little more than a suggestive value, we merely hope to have disclosed the conditions which would necessarily govern such an attempt should metaphysics undertake it.

[Reprinted from THE PSYCHOLOGICAL REVIEW, Vol. VI., No. 1, January, 1899.]

THE STRUGGLE FOR A SPIRITUAL CONTENT OF LIFE.[1]

Eucken's latest and most significant work has as yet received no adequate notice in the English or American philosophical magazines. The following is an attempt to give the reader some understanding of the methods and conclusions of this remarkable contribution to the metaphysics of our time.

While the reviewer is, of course, responsible for the general run of the following, he has taken the liberty of paraphrasing the text in numerous places. In this connection it may be well to say that the paper was submitted to Professor Eucken, who advised its publication in its present form.

He who, to-day, raises the question of the meaning of existence and the goal of our activity is caught up not only by the stream of the time, but also by a great flood which springs out of the world's history. The answer to which he is carried is clear and simple. Man belongs to nature—he is a part of her—body and soul. She surrounds us from outside; she rules us from within. She points out to us the only way to truth. When man in his pride and strength turns from nature, his home, and pictures to himself the existence of an independent world of spirit, he has only fallen into error—he has only gone out in search of a fabulous realm. And this vain thought of a spiritual world is only a bar to truth and to happiness. As such it is to be fought and conquered.

With this thought of our time has come a great turning-point in history. Through it there arises the hope of a return to primitive, elemental truth. Once more humanity shall be revived through closer and more intimate contact with nature.

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[1] Der Kampf um einen geistigen Lebensinhalt; von Rudolf Eucken, Professor in Jena. Veit & Comp., Leipzig. 1896.

Into such a relation to nature our time has actually brought us. And this it was able to do just by means of its incomparably sharp distinction between spirit and nature. At first both were one, indistinguishably woven together. The reflection of ancient times and the Middle Ages spun around nature a web of human thought. But this network was to be broken—nature was to be seen in its independence, in its self-existence. Its true being, as distinct from man, was yet to be distinguished, and the soul, as an evil spirit, was to be driven out. This accomplished, nature was seen to be a complex of spiritless masses and motions—all unity was dissolved into small and smallest elements, all worths and ends as mere figments of mind were banished in behalf of a self-sufficient, self-satisfying actuality. For in this vision of nature, so simple and so complete, where is there place for thought? in this vision of world-energy governed by an imminent logic of its own, where is there room for spirit?

As soon as this reduction was accomplished and spirit was driven out of nature, spirit and nature were seen to be two opposing realms. The independence of each was recognized. But nature revolted against this opposition. She turned against man in his isolation and in his alienation. She went out to draw him to her again, to subjugate him. And she succeeded. That she was successful was due to the very power which man had acquired over her by virtue of his alienation from her.

The decay of the vision of the Middle Ages and the rise of an exact natural science was a triumph of man over nature, a subjugation of the external world through human thought. And so, also, the application of technical knowledge and skill. But, again, it was in reality the vanquished which was victorious. For the vision which resulted from the outgoing of man to the external world to overcome it, was so clear and well ordered that it acquired a peculiar power and charm, by virture of which it was carried over to the inner world. Our concepts of the natural became so definite and exact that on their lines was built up our view of the spiritual. The more our knowledge of the exterior world develops, the more are we occupied with it; the more our technical skill increases, the more is life bound up in the machine; the more power man wields over nature, the more she rules his thought, his life and his senses. In this manner man, who believed that he had subjugated nature, was overcome by nature. And thus we find that the opposition between man and nature has been overcome by our time. It has been dissolved by the rise of our knowledge of nature and by the development of our technical mastery over her. There exists no longer a recognition of the two independent worlds, each existing in and for itself.

But the effect of this dissolution was not the reduction of nature to the inner power by which we came to rule over her, but the opposite. Man has been reduced to nature. He has become in his thought of himself a mere moment in the world processes, an insignificant factor in the varied interplay of phenomena. In the laws which grind out the world he must find his satisfaction; in the hard actuality which opposes him he must see the end of his existence. He falls back again into nature; there is a return to the naïve view of the world in which man and nature are one.

And in this philosophy of our time is there not a certain sublimity? He who would give up his self-existent spiritual world, who would again turn himself out into nature, must be prepared to leave behind many a desire cherished through centuries. But the reward of this self-denial is the falling down of the barriers between humanity and the all.

But sublime as this philosophy is; as deeply rooted in our time as it is; as strongly as the current of world history forces it upon us—we must still raise the question as to whether it can be our philosophy. For if it be true, our ethics and our religion lose their significance; if it be true, a really developing life is no longer possible; if it be true, there is, in short, no spiritual world at all. It is the primal thesis of our work that it is not true. It is the central belief of our author that man has broken through nature—that there exists in and for itself a self-centered spiritual world.

Of the thesis let us at the start make sure. Nature knows of no working from within, no being for itself, no self-activity, no initiative of the thing. Rather every element is bound to its environment, it exists only as a link in an endless chain; all work is the result of stimulus from without and is directed to another. If we men were mere things in nature, time and space would completely dominate; by them we would be forever limited and hemmed in. But the old opinion is false; man transcends time—it is his very nature to rise above the temporal flow. True, we stand in time and seem to be driven about in its stream. But not quite. Were it so, human history would be impossible, for such a history does not arise in a mere flowing by of events. In order that there may be a history man may not merely live his span of years, but he must reach back into the past; that which is gone must become present; he must unroll the course of time anew. And in doing this we do not merely contemplate the past: we take it up into our life; it becomes a part of our doing; it complements the present. Through history the limitation and contingency of the moment are overcome; through history we conquer time. And so with space.

And thus through history there arises a unity which transcends time and space. This unity is more than a mere summation—it is a welding of the life of the past with the life of the present. But as such it transcends nature. For nature is dominated by time and space. And in nature there is no unity which is not a mere being together—a mere summation. Man as a part of nature is a mere point—like other parts—the mere point of self-preservation. An inner subordination of the one to the whole, the recognition of the right and love of another as products of nature were wonders, compared with which the wonders of the religions pale. From time immemorial the energies of man have endeavored to reduce the source of all action to the mere interest of the individual. But through all time the self-sacrifice of man stands out in protest. What has the overcoming of self to do with the interest of self? Are the heroes and martyrs only sharper Jews than the rest of us? Is not all this a protest against a mere natural ordering of things? In our history and art, in our ethics and religion, in our very penetration of the external world, have we not overcome nature?

These facts of human life are the proof of our thesis. Through them we see the necessity of the existence of an independent world of spirituality over against nature.

But this new reality did not fall as a ripe fruit into the lap of man; it does not surround us as something given. It was fought for through work and experience; it was produced by self-activity; it is the result of a long and fierce struggle. For the mere natural processes could never have produced this spirituality—it must be the result of a free act, a transcending of nature through self-activity.

The first step in the struggle for a spiritual life was the lifting of ourselves above the mere natural environment, a freeing of ourselves from the limitation and narrowness of the immediate, a breaking away from the life which exhausts itself in its effort to preserve itself and to adapt itself to the immediate situation. For in order to have a spiritual world at all we must transcend the *here* and the *now*, we must raise ourselves above the demands of a natural environment.

This step marked the great turning-point in the history of humanity. It brought about something utterly new, something opposed to the merely natural life. It freed us from nature in that it freed us from the bonds of the immediate and from the littleness of the natural self. For as long as our activity was consumed in a mere adjustment of ourselves to the situation of the moment there could be no freedom, no opportunity for the creative work of spirit. As long as ourselves were mere points, the mere centers of natural instincts, there could arise no spiritual world. The immediateness of life and the punctuality of the selves of that life had to be transcended. For the spirit-world is not a world which rests upon a point. It is a world which rises above all points, which embraces all reality. Thus this spirituality which arose out of nature as a new creation was a sphere which floated above the individual. It was a whole, a unity. For the individual as such could never have conceived it, could never have created it. It was the whole which spiritualized the individual. And the spiritual life wherever it exists is something which is not dependent upon any one self, but something in which the particular self finds its existence. It is always an independent, self-existent whole. And yet this whole was brought about in the creative activity of man. His free act is needed that it come into being. It found its origin in a union of free, creative activity transcending all particularity.

And what is this common activity but *work?*[1] It is the idea of work which marks the great turning-point in life. Through work there arises a new content of life. By means of work we raise ourselves above the limitation and contingency of the natural *here* and *now*. For all work arises out of some transcendent whole; in it a unity to be realized is always presupposed. Work means life-work. At first this unity is the particular unity, a whole to be gotten by the individual. But even so the work of the particular brings about the work of the whole. The particular works are worked into the work of the whole. Reality is the work of works.

As this common reality is the result of work, so is work the result of transcending the immediate *here* and *now*—the product of our struggle to rise above the mediocrity of life, of our strife against the average.

In work we see a new creation, something which cannot be deduced from the spiritless masses and motions of nature. It is a self-centered spirituality, a self-active life, a world resting in the struggle of the whole. As such it hangs over against nature and the punctual self.

And thus, in conclusion, we see that the spiritual life has no existence and no meaning, no strength and no marrow without a rising above the average; that no such transcendence is possible without spiritual self-activity; that there is no self-activity at any one point without a self-activity of the whole, without a universal life, without the opening of a new world.

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[1] This word is a translation of *Werk* as distinct from *Arbeit*.

Man, as it were, hangs between these two worlds—between spirit and nature. Both are real. Of this there can be no doubt.

Nature confronts us at every turn. A large portion of our life is devoted to her. On the other hand, the world of spirit is with us also. To deny its reality is equally absurd. And what is man to do with these confronting realms? Both cannot equally claim him. At the start let us do away with the idea of an empty compromise. Nor can he reduce the spiritual to the natural. This attempt, as seen in the philosophy of our time, amounts simply to a denial of the reality of the spiritual. For centuries the idea of the development of all reality from the pure activity of spirit has exerted a fascinating power over man. But if we follow the links of the chain from Plotinus to Hegel we see that either life became a mere sum of abstractions, or that experience, which at the beginning had been so sharply pushed aside, was unconsciously called in to complete the intuition, to give life to the otherwise empty forms. Nor does the distinction between form and matter aid us. For, on the one hand, the spiritual is far too self-centered and real to stand merely as part of the whole. And on the other, nature is far too cold and capricious when seen in contrast to the spiritual to adapt itself as matter to form.

And yet the dualism is intolerable. The idea of the independent existence of two coördinate but different worlds of reality in life is more than can be borne. The opposition must somehow be overcome. These two masters man cannot serve. And yet neither of them can be denied.

If we would work our way out beyond this dilemma there is but one course for us to take. Both of our worlds are real and yet different. If we are to see them united in life we must see them both as the product of a reality deeper than either.

Here, again, we stand at a great turning-point and once more great possibilities open before us. We must grasp the world as the development of a substantial spirituality, of an essential life. We must see our own free activity as a part of a deeper life. We must see nature as a product of profounder reality.

With the idea of a substantial spirituality, which brings forth a new and peculiar being out of the depths of activity itself, there opens a new view of our world and our life, an altogether new experience of reality. Both of those worlds, each of which lived in its own right and seemed to pretend to the whole of reality, are seen to be expressions of an essential being. Our free activity must have a deeper life behind itself.

If these two realms are one in their origin, the problem is to realize that unity. It is ours to find in nature this primordial force, this substance; to wrest it from her; to appropriate it to ourselves. It is ours to conquer nature. The act shall take being up into itself; thus it shall itself become real.

This substantial spirituality is not a part of us; we are rather a part of it. Through it we acquire freedom; as a part of it man makes his history; we feel it stirring in us, and we go out to create. But this primordial activity will tolerate no limits; it will not be imprisoned; it will be hemmed in by no barrier. There is nothing in the world which may oppose it; it will brook nothing foreign or alien to itself. Therefore we, as stirred by it, must conquer the exterior world; we must transform it by our spirituality; we must take it up into our own activity. As the artist spiritualizes nature—as he, accomplishing the impossible, transforms it with his own inner life—so must we all overcome the outer world.

It is by this free act that the spiritual acquires character and determination. The inner world, hanging over things as the spirit hung over the waters at the creation, lacks substantiality. As it broke loose from nature and rested in its alienation from her, a certain indeterminateness possessed it. It saw nature as something hostile and foreign. But the spiritual life can acquire substance only as it, through activity, takes nature up into itself—only as it spiritualizes the external through free activity.

The first great struggle of mankind was for the existence of the spiritual. It overcame nature in the battle for a spiritual life. But the life lacked determination, and thus arose a second struggle. It too was a fight against nature; but the end of the struggle was not her destruction, but her spiritualization—it was the strife for the character of the spiritual.

And man, in so far as this world-power rises up in him, becomes world-power himself. Man as a part of nature is driven hither and thither by forces exterior to him; for he is but a mere point, a link in an endless chain. But when he rises up into his primordial activity he thereby becomes world-power. Through him, in him, by him, is world-history brought forth. Hereby he transcends himself, he rises above the punctuality of life, he becomes a part of the whole, his life moves on in the world life. Thus the individual becomes microcosmus, and the all a world of worlds. When doubt rises up in us, doubt as to God, the world, men and life, it must at last lead back to doubt of ourselves, the doubt as to the ideality of our nature, the presence of a spiritual substance in our life.

In our descriptions up to this point we seem to have traced the triumphal march of spirit, but in reality we have been following only the progress of battle. And this struggle is one which never ends. The strife continues in each plane of life. At first it was the struggle of spirit to raise itself above the chaotic manifold of nature—the struggle for existence; then it was the struggle to lift experience up into spirituality, that the latter might acquire determinateness—the struggle for character; and now we have to see this spirituality enter into a new strife for the world-power of spirit. For as soon as the spiritual life takes on concreteness and character, there arises a host of new contradictions which threaten its destruction, which seem ready to shatter the new life. The powers which seemed to have been conquered spring up again with new force; the old contradictions which seemed to have been transcended appear in new forms. The very forces which worked for good now seem to take on an evil nature. The woe of the world, its contradictions, the thought of death, which seemed to be the kindly spirits of man aiding him on, now turn against him. The whole structure of spirit seems to have been founded on sand and to be on the point of being shattered by the contradictions which have grown up within itself. Doubt as to the reality of the spiritual life arises; we faint in the struggle against the evil; the contradictions seem insurmountable, and we are threatened with the loss of that which we so hardly won and a return to naturalism appears to await us.

The first attack on the new life arises out of our new relations to nature. Here lies the first battle-ground in the struggle for the world-power of the spiritual realm. For the better we have come to know the exterior world, the more foreign it seems to be; the more we have to do with it, the colder and more alien it grows. The forces of nature work in blind objectivity, without respect to the spirituality they hem in and destroy. Fire, water, storm and earthquake annihilate; the little forces of destruction do not sleep. Nature works without respect to high or low, good or bad; she operates without feeling, and handles the individual, the masterwork of spirit, in perfect indifference.

And as the knowledge of nature grows with the development of spirit, there grows also the knowledge of the utter dependence of the individual on nature. We have long known that the soul is, in general, conditioned upon the body; but we now see in oppressive clearness how every spiritual activity is based upon the corporeal. And then the thoughts of heredity and environment steal in and shed their weird light over the world. And thus man, in his thought of himself, becomes a mere episode in the world-processes. Is it any wonder that he loses faith in the new world—in the spiritual substance?

And so it is with the moral world.

The ethical life has always been the great refuge of man from the bondage of nature. When all else topples and falls the eternal worth of the pure heart and noble mind has stood fast. Here, if nowhere else, man rises above the limitation of nature to the freedom and reality of the spiritual; in this realm, if in no other, the dark despot of the punctual self of nature is overcome. But, even here, the spiritual is threatened by the destroying might of contradiction. After this world has been brought into being, we see for the first time its inconsistencies. For, instead of an all-embracing love and justice, there arises a love and justice bounded and limited by the instincts and passions of the self of nature. Our morality is well and good only so long as it favors ourselves, our party, our narrow circle or our race. And thus the object of the moral world is a manifold of scattered units instead of the totality of humanity—a collection of little centers separated by a wide gulf, instead of the whole of mankind. Here we see, in all clearness, the triumph of evil, the unconquerable nature of sin, bound up as it is in all our spiritual activities. So we doubt the reality of our ethical life.

And we fare no better when we turn to history, for here we find the past to be only a great mass of actions done and gone. We are unable to draw from it the fresh, active present for which we had hoped. History should solve our problems for us—in the past of human life should be seen a line of steady development making for eternal truth. But instead of that, we find only a nexus of contradictory intuitions and faiths. History should have solved our problems, but instead of that it has travailed only to bring problems forth. And we lose our faith in the past of human experience.

And so is it also when we consider the nature of society, fate and the very spiritual power itself.

The evil does not lie on the surface; it reaches down into the fundamental conditions of our very existence. The spirituality which does appear seems too weak to overcome the great attacks which are made upon it unceasingly. In its own development it constitutes rather an indifferent form to a content than a full world. History has rather increased than diminished the complications. The new world has been brought forth, but only cracked and broken by fundamental contradictions. Once more we find ourselves in a great dilemma—again we have reached a position where we must either turn back or go on still further. No compromise is possible; to stand still is intolerable; some solution to the problem of our relation to the evil in the world must be found.

The history of world-thought contains many attempts to escape this dilemma; indeed, it has been largely occupied in endeavoring to offer some solution to the problem. There have been in general two great answers to the question. According to the first of these, the evil in the world is mere appearance, the good alone is real; according to the second, the evil alone is real, the good is mere appearance. The former is optimism; the latter, pessimism. Each comes to its conclusion by denying the reality of one side of the dilemma.

The first great plea of optimism lies in the thought that if we could but see the world from its center the evil would disappear. The bad is in the last analysis good, for through the bad the good rises up and grows. The second plea lies in the thought that if we would but do the good the evil would cease to exist for us—if we would but center our lives in the world of the pure and high the world of the impure and low would be forced into non-existence. But whether the optimism be that of consideration or of action, its falsity remains. For, no matter what our point of view may be, no matter how our actions may be directed, evil remains and must ever remain. It were as easy to prove that the good serves the evil as the evil the good. If we must write our theodicies why not also our satanodicies?

The essence of pessimism lies first in the thought that the world down to its very center is evil, and second in the act of giving up the hope of attaining the good or the true. The theoretical view of the world as bad and truth as an illusion must end practically in the giving up of the good and the true—the philosophy of evil must inevitably result in the philosophy of self-denial.

But if there be neither happiness, virtue nor truth in the world, what have we to give up? If the idea of the good be an illusion, what is the meaning of self-denial? The very fact that the turning away from happiness costs us so much effort and gives us so much inspiration is *prima facie* proof of the existence of happiness. And so with truth and goodness. Truth and goodness remain in all their sublimity; pessimism is but the turning away from them.

Pessimism and optimism may annihilate each other in their struggle for supremacy; but the good remains good, evil does not cease to be evil, and both are real. And the moralist still moralizes on the 'mixed character of human life.' Truly life is mixed, not merely on its surface, but in its very depths. And after all the dilemma still remains unsolved and still demands solution. But if there be any power and courage left in life there is one way of escape open—we can transcend the sphere of conflict, we can raise ourselves above the contradictions into a new realm. The world of struggle is not the only world; its barriers shall not block our progress. There opens a sphere of activity beyond the sphere of these contradictions; in it must we center our life.

This new order would appear as something transcendental, something which lies beyond the horizon of our world. But in truth it should only expand the real; it should command for itself the first place in our world and force all else into a subordinate position; but still it should be within the real, our real. The ultimate and final it must always be; it must contain all absolute truth; in it must be builded the world-power. As such and as such alone can it transcend all contradiction and overcome all opposition.

This is a hard saying—this last step in our spiritual life is the most difficult of all to grasp in thought and to realize in action. But the saying nevertheless is true. And that it is such we can see, if we can see at all, from the workings of religion. For this struggle and this realm are essentially the struggle and the realm of religion.

In religion the individual rises out of the contradictions of the world. He does this because he lays hold of the absolute life. The contradictions of the world do not disappear; they are rather intensified; but in that something absolute is realized, they are transcended. The barriers are not broken down; we leap over them. For in religion we leave this world of struggle behind, we rise up into a realm of absolute truth which knows no contradictions—the spirit reaches the plane in which it becomes the world-power. For the struggle to reach an ultimate point and to bind all life to it is essentially the struggle of religion.

But this new life is not an abstraction—it is a personal activity, a coming into relation to the absolute life. It is not something given, but something to be gotten by a free and original act. It is to be gotten because all that confounded us in the lower life is overcome in something higher.

If this new and final realm is to be seen from the standpoint of religion, it is now clear that the rest of spirituality is to be seen from the standpoint of culture. First of all we have a struggle for the creation and preservation of the spiritual in general; then the struggle to penetrate and overcome nature, and finally the struggle to rise to an ultimate reality beyond the contradictions of the former stages. The second of these steps belongs essentially to the world of culture, the third to that of religion. And these two worlds must ever remain distinct and separate spiritual experiences. They have often striven with each other; each has claimed its sole right to exist, but mankind ever returns to them both. Neither can be omitted from the great system of the spiritual.

In conclusion we may sum up the foregoing as follows:

We saw the world of the real open itself in three levels.

The first problem was that of the independence of the spiritual life. This life cannot exist as a mere expression of a foreign activity. It must be self-centered. That it arises in its purity was due to a breaking away from turmoil and particularity of nature and the formation of a new and peculiar realm of ideal worths. With the development of the independence of the spiritual there arose not a world of particulars which left alone the rest of reality, but the soul of the real itself. Through it came about a turning of being to its own truth, a finding of itself, a delving into the depth of life. As such it is more than a mere human phenomenon. Mankind is thereby taken up into world movements which raise man above particular powers and interests; which raise him above the mere average of life.

But necessary as this step was, by means of it alone the spritual attained only general outlines. A second step was required to secure it character. This was taken in order that the great opposition between the spiritual and non-spiritual external world be overcome. Thus, there took place a return of the spiritual to mere existence. Nature was grasped from the standpoint of the new life in order to spiritualize her. But this struggle could not meet with success without transcending of the work of the mere individual and the formation of a unity of spiritual life. Thus there arose a life-system, a totality of work, a spiritual substance, a struggle for the character of life. And thus the happy end of life and satisfaction with the real seemed near at hand. But the struggle with the content of our human experience developed unforeseen but fundamental contradictions. The new life was seen to be rent with irreconcilable oppositions, the actuality with which it had to deal, cold and indifferent. All attempts to reconcile or wipe out proved failures; the whole was lost but for the opening of a new world, the rising of spirit to a new level.

Thus a third step was undertaken, and there came about a struggle for the world-power of spirit. Life was raised above the contradictions; it was united to the absolute life.

But in so doing the old world was not to be given up. Its levels were to be preserved in their distinction and integrity. In the relation of each to the life process was to be found the consummation of spirituality.

From beginning to end this spirituality was to be conceived as a noologic reality, something not based on the *psyche*, but on the *nous*. It is a coming to itself of reality, being turning to its own truth.

We may not start with the world or with the soul, but with a life which is over and beyond these; which does not belong to man, but of which man may become a part.

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